CHAPTER VII

The Engineer Amphibs

A: In March of 1942, General Somervell, together with Admiral King and General Marshall, went to London for conversations with the British in connection with Operation Overlord, which was to be the next offensive action taken against the Germans. The essence of the problem was that Admiral King admitted that our fleet was largely on the bottom of Pearl Harbor, that our Navy had major combat missions to carry out, that they had severe problems in providing security for our transports crossing the ocean, and that they really couldn't take on a cross-channel amphibious operation in 1942. The operation in view was a cross-channel operation to be conducted probably in September 1942, with a force of approximately two divisions each (British and American) if it appeared that the Russians were being forced out of the war. This was hoped to be sufficiently diversionary, as far as the Germans were concerned, to force them to send more troops back to France to protect against this invasion. Consequently, while the Navy said that they couldn't do it, the British were not anxious to do it, let's say, because they had tried to convince the rest of the world ever since Napoleon said he was going to cross the channel 150 years ago that you couldn't cross the channel with an army. Of course, sometimes I think they had their head in the sand, because they did get 30,000 men out of Dunkirk -- under great difficulty, but still it was an amazing evacuation with any and all boats they could get their hands on. In any event, Somervell, with his engineering experience -- and this went back to flat-bottomed boats on the Mississippi and the development of the Higgins boat, later called landing craft but built for working in the Gulf of Mexico and in the reeds and rushes on the Mississippi River for bootlegging, bringing in liquor and landing it on the beaches at night -- Somervell said the Army could take it on. The Combined Chiefs of Staff approved planning it as an emergency operation.

I didn't hear about this until May out in Leavenworth, but I'm sure the staff planning had been in Washington since April. As a rather amusing interlude, we had then been at war for four months and everybody was getting itchy feet at Leavenworth -- "When the hell can we get out of here and go where things are being done, where the action is!" -- and this had been true

ever since December 7, 1941. There had been three or four cases of loss of people there that came up, so General Truesdell called us in and gave all of the instructors a very nice talk that he knew there was a war on, it probably would be a long war, that there was time enough for everybody to go, and that there would be no more defection from the faculty for a minimum of a year and a half or two years . . . two-year cycle.

Well, that lasted from about Wednesday to Friday, when I received confidential orders to report immediately to Washington as Chief of Staff of a projected force for special operations larger than a corps. It so happened that there was a cocktail party that afternoon, and it didn't take the word long to get around. I had nothing to do with it. The orders came out of the blue sky. I didn't know any of the people involved and didn't even know the subject matter. General Truesdell called me and I told him, "This is as new to me as it is to you," and he said, "Well, they called me up and they told me that they really want you for something very special, so I'm going to let you go." When I got over to the cocktail party, I hardly had time to get a drink because all of my fellow instructors were besieging me: "How in the hell did you do it, how did you manage to get out of here?," and I really hadn't had a thing to do with it.

I reported to Washington, to Colonel Daniel Noce in the Chief of Engineers' office. General Sturdevant and others briefed us on what the problem was and we got a briefing from the General Staff. We were told to put this force together, and I was told to go back, check out at Leavenworth, and report back into Washington immediately. I did, and we set up what came to be known as the Engineer Amphibian Command.

This was put under Somervell and, while I think this was the right place to put it because it largely was a logistical and transportation problem, it caused us trouble from almost the day we were born until the day we were inactivated, largely because of jealousy on the part of the Army Ground Forces that it was not put under their command. As a matter of fact, I was frankly told by a member of the General Staff that if I could arrange to get this transferred over from the Army Service Force to the Army Ground Force, it would almost insure our continuity. This is a fact; it isn't written in the papers, I'm sure, but this became a great problem. The problem was how to cross the

English Channel with relatively small craft; the problem was shore to shore, and our basic concept was to move the essential elements of an infantry battalion in a company of landing craft. We could get a platoon -- 36 men -- in the smallest landing craft, and we saw bigger and better ones on the horizon, but they weren't here then. As a matter of fact, the smallest ones weren't really in mass production.

The Navy, BuShips, had control over landing craft at this time. The Navy naturally favored the BuShips tank lighter; the Army favored the Higgins tank lighter in the next size, 50 feet long. The difference between the two was that in the Higgins tank lighter the metacenter was lower; in other words, the center of gravity afloat was lower in the water. The Navy had a few for tests, but BuShips, because they weren't invented by them, didn't like them. The main difference between the lighters which any layman can understand is that the deck of the Bureau tank lighter was above the normal water level when loaded. They had a bilge pump. This raised the center of gravity, or the metacenter, of the whole thing to a higher point than existed on the Higgins, and this adversely affected it seaworthiness. This was not a problem on the smaller 36-foot landing craft. The advantage of the Higgins lighter was that the treads of the tank, when loaded down, were below the water line, but you had to have confidence that if there was leakage your bilge pump could handle it. The Navy didn't have confidence in their bilge pump. If a bilge pump doesn't handle the problem, you can sink no matter where the hell the metacenter is.

This led to a very interesting test about the time that we were physically activated in June 1942. I'll get back to those dates later, but we ran two tests down at Little Creek and at Norfolk. One of them was the test on the Bureau tank lighter versus the Higgins tank lighter, and I told you the difference between the two. The result in that test was that the Bureau tank lighter almost floundered with the tank aboard because of the high metacenter. It couldn't stand the kind of currents we were in, while the Higgins tank lighter looked beautiful. We encountered tough cross-currents and high seas at the mouth of the Chesapeake Bay.

The second problem was more interesting. The British said, "You cannot cross the English Channel in these small landing crafts" and we were talking about these

36-foot landing craft, 50-foot tank lighters, and maybe a few others that were available; there were no big ones yet. The British were very interested in showing we couldn't cross the Channel, and here's what happened.

Shortly after we were activated on June 10, 1942, Washington agreed, since the British said that you cannot cross the Channel in small craft like that, that tests would be made. I was put in charge of the tests, and I directed my people to get a 36-foot landing craft, personnel, ramp-type. When I got down there on this particular day that I was going to make the tests, the Army turned over to me a lieutenant and 36 men from the 21st Aviation Battalion, which was stationed across the bay from Little Creek at Langley Field with the Air Force. We had on oilskin coats, which, of course, are no help in the sea: you get soaked anyway and they stick to you; you're uncomfortable, and the water was cold. My plan was to take this craft out and follow alongside a 100-foot tugboat that was going to sea that could keep us from drowning if we swamped. There was quite a wind and the seas were rough. We set out early and the plan was to take us out past Cape Henry into the open sea and then head us to shore at 1:30 in the afternoon, at which time the Navy, the British, and all the people from Washington were supposed to be down there on Virginia Beach to see that men just couldn't come ashore in fighting condition after braving rough seas in small boats.

We kept going. Most of the men were sicker than hell. These landing craft were not very flexible and not very seaworthy. Their sea-keeping qualities weren't good, so we had a lot of green water over the bow. We had rough water going out, everybody was sick, and things were pretty well messed up in the boat. We got out to the point where we were going to turn about. This was six or eight miles offshore and it was probably noon or so, so I said, "We'll soon be on our way, men, so you'd better get yourselves straightened out, get your faces washed off, and see what you can do to pull yourselves together here." Well, some didn't. Some didn't care whether they lived or not, you know; it's easy when you're seasick. We got started toward the shore, and I saw this gang -- Navy admirals, British admirals, Joint Chiefs of Staff, Army -- hell, we had more people there than you could shake a stick at -- on the skyline along the shore near Virginia Beach or

northern Virginia Beach. There was about 100 yards of beach from the water line until you'd get up to the crest, so, as I got in close to about half a mile, I said, "Okay, now every goddamn one of you stand up." So I went around and inspected them all standing up. I looked at them all as I went around, and I said, "Can you make it in here?", and some of them said enthusiastically, "Yes, sir," and some of them said, "No, we don't think we can make it." So as we got in a little closer I said, "Now listen, you see that line with all the goddamn admirals and generals there," and they all said, "Yes." "Well," I said, "Chase them off that ridge. That's where we're going; and if there's any man on this boat that doesn't get up and charge through that line, you're going to be put back on the goddamn boat and go back the way you came." Well, I got a lot more sprucing up, believe me. So when we get near shore I said, "All right, take off those goddamn raincoats, throw them in the boat." They had on their cottons and they were soaked, there's no question about that. They had their rifles and they had bayonets, so just before we got there, I said, "Get your goddamn bayonets out, get into your three-squad formation, first one straight ahead, the second to the right, the third to the left. You go up there in a line of skirmishers and keep moving." And, by God, they did. It was the damnedest thing I ever saw. These youngsters broke their damned backs going over that crest. They didn't figure I was kidding, and I wasn't. We wrote up a report and the Chief of Engineers put his ribbon and his sealing wax and all on it, and that was the document that showed that men probably could cross the English Channel with difficulty and still be fit to fight.

There is a sequel to this, which I ought to tell right here because it's related, and then we'll get back to the Amphibian Command. In 1944 General John Deane, Johnny Deane, who'd been at Leavenworth as an instructor with me, was then the chief of our military mission with Ambassador Harriman in Moscow. Stalin was getting pretty well fed up that we hadn't crossed the Channel. He keeps saying to Harriman, "I can cross the Dnieper River so why in hell can't you get across the Channel?" General Deane wanted to show him some of the difficulties in crossing the Channel but that we could do it and would do it eventually. So Deane sent a cable over to the Operations Division at the War Department and said, "Have you got anything that shows the difficulties in crossing the Channel as against just crossing the Dnieper, because Stalin

thinks it's the same thing." So they came to me as they couldn't find a damn copy of our Virginia Beach report. I was then the Director of Military Training or Assistant Director in 1943. They sent Colonel Bill Baumer to see me, and he said, "We've got this message from John Deane. Do you have anything that will show the difficulties in crossing the Channel? Stalin thinks it's just a damn river crossing." I said, "Yes, when they got up this report, I purloined a copy and I've got it all together with the red sealing wax and the ribbon from the Chief of Engineers and all," so I sent that over, and that's the last I've ever seen of it. They tried to prove to Stalin from the report that there were real difficulties, that we were going to do it but that it took more time. That's the byplay on that.

Now, to get into the story of the Engineer Amphibian Command. We did a lot of talking in Washington, a lot of organizing. We got a staff together and put them to work on their particular duties. We had a Colonel named Vandenburg as G-4 of the Command. He was Naval Academy, so we figured he knew something about the Navy -- where to go, what to do, and logistics. He also happened to be the son-in-law of Admiral Ernie King. We got officers to fill out our staff and started recruiting.

Recruiting was interesting. We had special authority to recruit from any source where we could get personnel. You may remember that we had to use a knitting needle in those days to go through Form 20s for information. All the Form 20s in the Army were gone through and, from records, all that had any amphibious connotation to them the Army made the men available. This gave us a fairly large number of men. We were assembling initially around 9,000 to 12,000 men at Cape Cod as fast as we could get them. In addition, we had several Regular Army units, including two or three Engineer battalions, a ponton battalion, certain engine maintenance companies, and some ordnance. In the meantime, Colonel Noce and I flew up over Cape Cod where we were to locate. We were ordered to set up our base at Camp Edwards, Massachusetts, and then to search for additional sites on Cape Cod. We would fly up there on weekends after we got through with work in Washington, and finally selected several sites. We took over Washburn Island where nobody had been in 20 years. We had to wade ashore the day we went there, but that's where we made our forward base. We went into Oyster Harbors, we

went into Cotuit; and this was on the 10th of May that we made our first visit. We activated the Engineer Amphibian Command and the 1st and 2d Brigades on the 10th of June, one month later. In addition we had to draw up the tables of organization, equipment, the training programs, and start procurement of everything.

I must inject this little story because it shows such stupidity on the part of a Regular Army colonel; it's hard to believe. Camp Edwards was largely a tent camp with a few frames for latrines, mess halls, and supply. At the center of the camp were three concrete buildings for the division commander and staff of the 26th Division, Massachusetts National Guard. Three small concrete buildings -- the center one of which had a poop deck and a couple of offices upstairs where the commanding general and his aide, his chief of staff, and his secretary were. Directly in front of this was the monument to the 26th Infantry Division in World War I in France. It had a gun, a plaque, and a flagpole maybe 90 feet high. The post was commanded by an old Cavalry colonel, who was certainly senior in permanent rank to Colonel Noce but was about to be promoted to brigadier general very shortly. And the Cavalry colonel was determined to have the tallest flagpole in front of his headquarters anyway.

One morning we saw men out in front and they were removing the cannon from in front of the building. We didn't think anything about it. The next time we knew anything was going on, later in the day, we heard a terrific crash and, in looking out, we saw that the Post Commander had sent some welders over to cut down this 90-foot flagpole in the middle of the 26th Division monument; whereupon a tractor was hooked on and dragged it about three-quarters of a mile across the parade ground to an old wooden World War I-type building that was the Post Commander's headquarters. There they were going to erect the pole. But in dropping it, they had put a permanent kink in the pole, so that they were leaving it there while they were trying to straighten it out. There were still people from the 26th Division who hadn't cleared the post yet because we had said, "Keep your buildings on the side and take your time." Believe me, they got this report to their commanding general in no time. The next thing that we knew General Miles, who was then commanding the I Corps Area in Boston, showed up and there were some red faces around Post Headquarters. The colonel, I might say, didn't even

get to spend that evening on post; but he got a nice bill for a new flagpole, which he bought and we put back up. You can't imagine anything as stupid as that.

The Navy was not at any point cooperative. They never supplied any personnel. The Coast and Geodetic Survey was fine in its field, and the Coast Guard was wonderful. We had a company of 200 men from the Coast Guard, together with a chap -- then a commander, who later became Admiral -- Harold Moore, a great guy and a good friend -- and a number of very fine officers. The Navy simply was not cooperative. They did have a couple of Marine officers assigned who showed a modest interest and were helpful, although the Marines had an attitude that they were way out in front amphibiously. Actually this was not the case, although they had been exposed to it as a basic mission. The Navy was not very interested, and even for the next two years after the Torch Operation in Africa, they still used to advise young officers that unless they were successful, they were going to get shoved into the amphibious and supply forces. We had a very substantial number of Army people in Army elements. We had a fine Coast Guard detachment. We had good support from the Coast and Geodetic Survey. We had some support from the Marines.

The next thing that we did was to recruit Cape Cod fishermen, and this gave us the rough and tough know-how. The third thing that we did is we had special recruiting authority -- we went to all of the power squadrons in the United States; the men in civilian life who do other things, but love their yachts and power boats as a pastime. They came in droves and brought their maintenance mechanics from the marinas. So here we had the know-how and the brains, we had the tough know-how of the sea in the Cape Cod fisherman, and we had the Army element; these three elements put it together beautifully. It was a great team, and there was a hell of a lot of talent there, so we went to work training them and at the same time we started training ourselves.

We had 50 civilian yachts turned over to us, and these varied from 25- to 60-foot boats. No two had the same kind of engines; these were the kind that wealthy civilians turned over to the government for a dollar a year. The government maintained and operated them, and assured the owners they'd get them back in the same condition. From a maintenance and training

standpoint, they drove you nuts. Furthermore, we had two or three kinds of Navy landing craft -- not many, but we had two or three kinds, about 30 -- they had about three kinds of engines in them; so as far as having a uniform fleet speed or anything uniform, this was impossible. But for basic training and getting used to boats, it was great. Then the Higgins boats started coming out, and we started getting equipped so that by July we must have had a good 200; and 200 would move a regimental combat team.

At the same time that we were training, however, we had first the 36th and then the 45th Division on our back; they were getting lined up and ready for the Torch Operation which was scheduled for November in North Africa. So we had the problem of joint training, as well as training ourselves. It was an absolutely fascinating period; it was tremendous, and the proof of the pudding was that while we activated the command on June 10, that on August 10 we shipped one brigade of 7,000 men to Europe, fully equipped as far as their individual and basic unit equipment was concerned. This was quite an accomplishment. Colonel Henry Wolfe, our G-3, was promoted to brigadier general and given command of the 1st Engineer Amphibian Brigade. We had established a unit concept where an amphibian boat company would handle an infantry battalion, an amphibian boat battalion would handle an infantry regiment, and a boat regiment of three battalions would handle a division. We were looking for other types of support craft which were on the horizon, such as the 105-foot tank lighter which was being built up in Manitowoc and the duck (DUKW), a new two-and-a-half ton amphibious General Motors truck. The first tests that were ever made of those were off Princetown on Cape Cod. We were interested in many other new items including the use of rockets aboard ships and trucks for the assault, infrared lights and glasses for night driving, and other items -- just enough to make the Army Ground Forces want us, but we were in the Army Service Forces. I could see how it could benefit the ground forces, but it didn't make sense at that time to try and make this change. It would be as appropriate in the ground forces as a support element as it is for the Marines to have their own air squadrons behind them, which I think is great. It's the same type of relationship; there was nothing wrong about it, except that it would be hard to do in the melee that we were in.

All doctrine had to be written. We wrote the doctrine for this. You've got a box full of it up there, some of the early publications that we had. The sea horse, our insignia -- the little red sea horse on a white field with a blue boundary -- was designed. Let me explain the sea horse, which is something I fell in love with when I was with the WPA in New York City. This may sound a little far-fetched to you, but if you ever go out to Jones Beach State Parkway on Long Island you'll see the little sea horse. Jones Beach State Parkway was built by the WPA in New York City; at least it was renovated the same as Jones Beach was, and the little sea horse was the insignia designed for it -- just the horse itself. When I became the Chief of Staff, in looking for something amphibious, I thought of the sea horse. So I went up to Bob Moses' office and got the original drawing and from that, through the Quartermaster Corps, we had this insignia of the red sea horse on a white background with a blue border developed to the same design as the sea horse used on the signs along Jones Beach State Parkway, which is an interesting little story. We wore this on the pocket of our shorts and jackets. We started wearing it on the left shoulder, but later the decision was made that we would wear the amphibious patch of Combined Operations, Mountbatten's outfit. That was the British patch and you see the eagle, the gun, and the anchor; in other words, Army, Navy and Air Force, combined operations. The Navy had that in a different color. We had ours on a blue background with gold. The Navy had theirs in a black background with red, and I've forgotten the British color scheme. The design for all services was the same, so when they said, "That's your shoulder patch," we got special authority to wear the sea horse on our pockets.

Q: I see. I read some correspondence that you had where you attempted later to get even more of a distinctive insignia of some sort for your people, but you were turned down.

A: The Quartermaster heraldry staff had some weird ideas. They tried to force us to use ichthyosaurus as our symbol but I finally talked that down by saying, "Well, how in the hell when a man goes home is he going to tell his wife that the insignia on his shoulder is an ichthyosaurus, when he can hardly pronounce it or even spell it." So we stuck by the sea horse.

We had some operations in such places as Chappaquiddick and other places on Martha's Vineyard. That has become quite a familiar name now, but in those days we trained our crews in the use of sounding equipment at Chappaquiddick. For instance, whoever was leading one of these attacks had to have a fathometer and be able to know something about the bottom of the sea where he was.

Chappaquiddick and that vicinity was very interesting, because we had to cross the outlet of the river before we struck the right beach there, and obviously the depth of the river channel was greater than on either side; so when they went far enough south and turned back on whatever the proper course was and crossed the river channel, they knew that the beach was going to be on the other side -- elementary, but necessary training.

We developed a great many things -- beach photography, the use of colored lenses in photography from the air to determine the nature of the beach, the runnels, the depth of the water, and things of this sort. Both green and red lenses told different stories. It was extremely important that the direction of flight of your aircraft and the direction you focus your camera be exact with respect to the sun at any given moment if you were going to get results. A lot of these things we learned, and we learned many from the first European to be commissioned in our Army after we went to war, a splendid chap named Hugo Van Kuyck.

Hugo was a Belgian; he was a lifelong friend until his death some years ago. He escaped from Belgium, was an air and yacht pilot and a lover of boats. He was lecturing at Yale on city planning before the war. He was one of the outstanding architects of Europe. When he escaped, he came over to the United States and soon received a commission as a first lieutenant. Van Kuyck was quite a remarkable man. We found out about him and got him assigned to us. He did some remarkable work with photography and many other things. While I never knew I'd ever be Chief of Research and Development in the Army, at least in those days, I had gotten $3 million from the Chief of Engineers, which was a lot of money, to do our research. We also came up with an underwater exhaust for the landing craft. One of my missions in Europe in 1944, when I was sent there by Somervell, was in connection with amphibious planning and operations for the upcoming invasion. I went to Inverary and then

down to Slapton Sands for one of the final training exercises. At the headquarters I found Van Kuyck, who was then a lieutenant colonel with the G-3 section in planning, and he made one contribution there that was a real one.

He discovered that the data base, the control data for British hydrographic maps, was different than the French data base. It had never been checked before, but when you consider that the beaches we were to land on in France had a very flat slope, and the difference between high and low tide sometimes made a difference of about a mile and a half between the actual shore line, then an exact knowledge of your mean datum, or the actual level, became very important. It could have been very, very embarrassing if this hadn't been found out, because there would have been many more ships that would have floundered or gotten hung up in places where this wasn't supposed to happen because of this difference in the data base. That's really a remarkable thing to have only been discovered in 1943 or 1944. We did a great deal in developing beach photography, in improving landing craft . . . and in navigation. The landing craft that were available up to that time were literally hard to navigate. A soldier could shift his rifle and the compass would swing ten degrees. We found that we had to rely on better navigation equipment, but this couldn't be done before the Torch Operation. We weren't handling landing craft in the Torch Operation. That was a Navy job and that brings up a rather sad story in itself.

I told you that we sent the 1st Engineer Amphibian Brigade to Europe in August. Admiral Stark sent back a cable saying, quote, "The honor of the Navy is at stake if anyone, except men in Navy blue, operate landing craft." Well, this sounded all right to General Eisenhower, so he ruled against using the Amphibian Brigade as such. At that time the brigade was organized with a boat regiment of three battalions, each to carry a landing team, a regimental landing team, and a shore regiment of three battalions to perform engineering services on the near and far shores. That regiment was used for shore work, and the maintenance company was used in support of the operations and the repairs of ships. I'm sorry, very sorry, to say, but I think that this should definitely be in the record about the misuse of the boat regiment, so here's the story on the boat regiment.

The boat regiment consisted of 3,700 men to operate and maintain the landing craft, except for third- and fourth-echelon maintenance, which was done by a separate company. This regiment was largely formed of the men who had been brought in from the power squadrons and from Cape Cod fishermen. These men were skilled small boat operators, but since London "didn't need them" to operate landing craft, they made them, in the great un-wisdom of the Army at that time, into a truck regiment. They served as a truck regiment landing at Arzew Bay in North Africa, and stayed there as a truck regiment. This is a disgraceful episode in the misuse of talented men badly needed for amphibious operations in the Pacific, too. I went to the higher echelons of the Army and said, "For heaven's sake, do something better with them. If we can't utilize these men better, let's transfer them to the Navy. Let them put on blue uniforms, but don't waste this kind of talent, which is irreplaceable, by using them as a truck regiment." They didn't do it. The Navy landed that operation, but they were unskilled too. So were their small boat men, and from launching points six miles off the North Africa shore, they missed their assigned beaches by at least six miles, which is quite an angle of approach, I must say. It's just a crime to think of our skilled boat handlers not being used to better advantage.

The force commander on the Torch Operation was Admiral Hewitt. Hewitt was never too friendly toward our command. Admiral Dan Barbey was in charge of amphibious training for the Navy. When the Chief of Naval Operations found out about the Army's progress, he told Barbey to get up to Cape Cod and see what the Army's doing. Remember, we'd been activated on June 10. Barbey came up and spent the weekend of the 4th of July with us; I remember that very clearly. He was amazed at what he saw. This was July 1942, three weeks after we'd organized, after we'd been activated. He was impressed by what he saw and he went back and told Admiral King, "The Army's got more there now than I've got for you at Norfolk." Another part of the story which will come later was as to whether or not he was sent later to Australia to see that the Army didn't take over all of the landing operations for MacArthur. Barbey was a very fair-minded man; I liked him.

Q: I noticed on 21 December of 1942 you wrote a letter to Hugh Casey, who was then MacArthur's Chief Engineer, and you made the comment then that Barbey might have been promoted downstairs by the Navy.

A: We've got quite a little story on this Amphibian Command, and this needed telling.

Following the Torch landings and the non-use of our skilled boat crews, the future of our command was up in the air. The war was concentrating on Europe. If we weren't going to be used in Europe, where would we be used? As you know, minimum attention was being paid to the needs of the Southwest Pacific at that time, and I don't say that was wrongfully so. I mean the U.S. was concentrating our somewhat limited resources at the time where they thought they were needed most, in Europe and Northern Africa. This is not a criticism of our strategy, but it did leave MacArthur out on a limb. There already was competition within the Army on the part of the Ground Forces, who were still somewhat teed off that "Amphibs" were under the Service Forces. This didn't help us any, because much of our staff came from the Ground Forces. On the part of the Ground Forces there was a terrific amount of needling and nit-picking; General McNair, the commanding general of the Ground Forces, was a great person for detail, and because the Army General Staff consisted largely of Ground Forces personnel, despite the fact that we were an Army Service Force element, our tables of organization and equipment were given to the Ground Forces to analyze and approve. We had to satisfy General McNair and his staff, and it became a real nit-picking operation. In other words, if you said that you needed ten trucks, they'd say, "Why can't you get along with nine?," and a couple of weeks later they'd say, "Well, why do you need more than eight per company?" just to pick an example. Then it would finally get down to where after considerable delay they said we only needed eight trucks, "Why do you need two-and-a-half ton trucks? Couldn't you get along with two halves and three one and a halves?. Then, if you can use one and a halves, couldn't you use jeeps instead?" It was a real goddamn nit-picking operation, I'll tell you, and it hurt. In any event, the 1st Brigade was broken up in Europe. It had been organized into a boat regiment and a shore regiment, because it was a shore-to-shore crossing that was envisioned -- which, I suppose, is why they found some question as to how it would be used in a ship-to-shore operation, such as in the Mediterranean, instead of crossing the English Channel, for which we were organized. The Shore Regiment had near-shore and far-shore elements, battalions, and companies. In other words, we could take care of the beachheads on both sides. This was

anathema to the Navy, because they had their own beachmasters. They wanted to control the beaches, so we had a few doctrinaire problems to solve. The worst thing probably that happened was that they took the boat regiment . . . which consisted of three battalions, each prepared to haul one infantry regiment, and it had three companies in it, each prepared to haul one infantry battalion. And they took this regiment of 3,700 men, and this is where we had really melded our Marine talent -- in other words, our power squadrons, their maintenance men, the fishermen, and the soldier. They took this outfit -- which had skills that they couldn't replace, which didn't exist anywhere else -- and converted them into a truck regiment and used them in Arzew Bay; this is the point today where you read a lot about the port and Algerian oil coming out of it and all. This was on the road from Oran to the east and those poor chaps never did get back on a boat, or use any of their talents, except in maintaining trucks. We did have, at the brigade level, a base-shop company, to perform third- and fourth-echelon maintenance, work beyond the battalion or regimental capability. We had the highest skills that we could assemble in this engine rebuild effort; it was really Ordnance in the way of marine rebuild. This organization was kept together -- this one company, probably 300 men -- and they did a tremendous job. They did most of the work in patching up ships that were damaged at sea. A year later when I went to Naples, they were the only ones that were doing the job of marine maintenance in the Naples, Italy, harbor.

It was quite apparent by September that there was a change in the mission of the Engineer Amphibian Command. It was planned to be organized with six brigades. We had then organized three. At Cape Cod, the 1st Brigade had trained itself and, in addition, was also training the 36th Division, Texas National Guard, which left by early fall to participate in the North African landings. After the 36th Division, General Ridgway brought in the 82d Airborne Division and they went through this phase of training with the 2d Brigade.

The basic task was to acclimate these troops to the loading and embarking techniques, take them out to sea (at least giving them some feeling for the ocean) and show them the problems that they would encounter in debarking under fire on a hostile shore. Our job was to take them from the time they got ready to embark on

the landing craft until we put them on the opposite shore. The Ground Forces supervised that training by what they called an Amphibious Training Command, under Brigadier General Frank Keating; as usual, the interface between their command and our people who were doing it created some difficulties, but not insurmountable ones. There was a lot of goodwill expressed on both sides, and we tried to work things out as best we could, because after all, it would be our troops as well as the 36th Division that would suffer if the operation failed.

In the early days then, the 36th arrived -- in early July, only one month after we were activated. We were quite limited in the number and types of landing craft we had. Most of them, like the 50 civilian yachts, probably were no two of the same make or using the same engines, so the maintenance problems were severe. We did have the people who could handle them well, and we had good marine mechanics. We took over most of the marine shipyards and repair shops along the coast -- like at Falmouth, Cotuit, and Oyster Harbors -- so we did fairly well, considering our problems. Parts were difficult to get. Landing craft -- we eventually got about 50 from the Navy, but they were of several types. There was the Bureau type which had two or three different kinds of engines. Some of them could do about five knots, and some of them could do about nine. Consequently, problems of fleet speed and maneuverability, and keeping them together at sea, particularly in tough weather or with poor visibility, was a real problem in control.

Q: I visualize, as you describe this, that the forces that were involved would probably become discouraged, frustrated, perhaps because they didn't think they were getting the right type of training.

A: I'm sure there was some of this, despite the fact that we acquainted their commanders with what we were up against. We started training troops of those divisions when we ourselves had only had our own men together for only a matter of three weeks, and this is pretty rough. Our troops were literally in basic training, and yet we were taking units -- elements of a division, perhaps a company or a battalion at a time -- out to sea. I'm sure it wasn't later than August when we had a couple of pretty good-sized landing operations over on Martha's Vineyard.

We would put out at about 11:00 or 12:00 at night. These were movements at night by sea with comparatively green forces, and this is where we were so fortunate to have the skilled yachtsmen who understood what they were doing and just not a bunch of landlubbers in these cruisers and landing craft or we would have had some bad accidents and losses. We were very fortunate; our accidents were very few, and I really don't know of any casualties that we suffered at Cape Cod. I do remember one that occured later down on the Florida coast, which was severe. But in any event, we went ahead with this program. The 36th Division moved on to somewhere like Patrick Henry or Pickett, because they were to mount out of Norfolk for the Torch Operation. They sailed, I suppose, in late October. In any event, it became apparent in the fall that our mission was being reshaped and, after we activated three brigades, no more were authorized at the time. So what were we going to do with the 2d and the 3d since Eisenhower wasn't going to use them in Europe? The idea came about, and I don't know who initiated it, but, "How about helping MacArthur in the Southwest Pacific?" He was trying to get along on a shoestring. So we worked and worked on the general staff in operations, and finally got authority to visit MacArthur.

Let me back up just a little bit. In August, a couple of very sharp young lieutenants named Henry Hoskins and Frank Walk came to see me, because they were aware of this problem, and they said, "You know, we could prefabricate these landing craft and move them in large numbers on ships to Australia, whereas now all the Navy can do is carry a few on deck where they are running into competition for space with fighter planes and tanks and other large items that can't go below deck." This made real sense, so we took a separate building and locked them up with a few other people and we plotted and planned. The Chief of Engineers allocated $3 million for research. General Noce approved the concept. We wrote our own travel orders and high-tailed it down to Higgins Boat Works in New Orleans where they were turning out the best landing craft. We talked it over with Mr. Higgins and his people, who were enthusiastic. Our initial idea was to fabricate, but not assemble, the 36-foot plywood craft using a standard Detroit diesel engine, in other words, a General Motors diesel with a Grey Marine transmission. Our people came up with a final plan and Higgins bought it. The plan was to build all of the parts of the landing craft with troops, even to

enlist some of the men working in the Higgins plant as part of a base shop battalion, send it over to Australia, and assemble the craft for MacArthur. We finally sold this idea to the Army. We had great opposition from the Navy -- it couldn't be done, they were short of this and short of that; but one time, one commander sort of led with his chin. He was worrying about such things as sea anchors and knives for the boats and little things of that sort. We dispatched this with a couple of curt remarks, I guess. When that kind of a red herring was being strewn across our paths, the staff overruled them. We were authorized to send our team to MacArthur, explaining that "We have this kind of an Engineer Amphibian organization and could furnish you two brigades since they're not going to be required in Europe, and would you like to investigate it." And he said, "Yes, send somebody at once." And so General Noce sent me with a team to Australia. Our 2d and 3d Brigades were still available. When the 3d Brigade was activated in September at Cape Cod, the 2d Brigade had been moved to Carabelle, Florida. Let me get into that briefly.

It was quite apparent as the summer moved on that all operations on the Cape would stop by November because of the severity of winter weather. So where was the winter training base to be? General Ogden, who commanded the 3d Brigade, myself, and a couple of others were delegated as a task force to go and find a place for our winter training. We investigated St. Catherine's Island, which is near Savannah, Georgia. We investigated Fernandina, which is at the mouth of the St. John's River, just below the Georgia border. We looked into Fort Pierce, where the Navy was just starting to do something. In none of these, however, was there suitable surf for our training. In any event, to make a long story short, we finally settled on a place called Carabelle, Florida, on the Gulf of Mexico. It has an island called Dog Island offshore in front of it. It is east of Apalachicola on the western coast of Florida, and this is where we decided to train.

From a standpoint of terrain, it was really a horrible place. It was all jungle, poor beaches, and mangrove swamps, but it was just what we were going to encounter in the Southwest Pacific. We built the cheapest kind of structures to put troops in there for a short period of time. Our greatest problem was getting the Medical Corps to approve it, because they

said, "This is a terrible place to train. You'll get all sorts of dysentery and malaria and all other diseases." We said, "So what? Let's find out about that here, and not wait until we get into action in Australia before we find out about it." This was a good point to make, because in Australia, where our troops were going, the 32d Division had frightful problems from disease when they got into combat.

The Japs were almost into Port Moresby, over the Owen Stanley range at that time, and the 32d had put one regiment behind the range to cut them off in the Buna area. In no time more than half of these troops were down with jungle diseases and were totally ineffective. As a matter of fact, they were worse than ineffective; they were a burden because it took able-bodied men to take care of them. So we had said, "Gee, let's learn the problems of the jungle right here and not after we get there," as far as health and men taking care of themselves.

I have forgotten exactly what divisions came down there to train, but I do remember the first division was the 4th Infantry Division. The 28th under General Omar Bradley came later in 1942.

In any event, we'd just moved our 2d Brigade to Carabelle, the 3d was still at Cape Cod, winter was approaching, and I was on my way to Australia.

Q: One of the things that we're interested in is decision-making. You mentioned that you looked at four different places, Fort Pierce and then Carabelle being the last two. I was wondering about Carabelle . . . we sometimes have the idea that there are deep studies that go into making these decisions. I'd like you to tell us specifically, how did you select this place -- from the air -- from lots of study of the area, or just by looking at it and saying "this looks like the Southwest Pacific, I think we should use it"?

A: Somehow we'd gotten a lead to go and look at this area; I don't know from whom or where, but we made the decision to use it. General Noce recommended it to the War Department, and what he said was usually approved by General Somervell and the General Staff in Washington. We got wonderful support.

Q: Okay, Sir. I believe you left San Francisco on 4 November for Australia. Did you make a trip again down to New Orleans and other places before you took off?

A: Yes, I did. At that time we were drawing up plans with Higgins for a base shop battalion of three identical companies. This was to operate an assembly line on a three-shift basis in Australia. That is what we were planning. This required about 750 men, and I think that was organized before we left for Australia as we wanted to get training started. We inspected them in New Orleans just before we took off for Australia. Captains Walk and Hoskins went with me, and also a very capable marine maintenance man, Warrant Officer Barney Grabau. He still lives in the Buffalo, New York, area, I think, and runs some marina. There may have been one or two others; I'm not sure. It seems to me that there was a total of five or six of us.

In any event, we left for Australia, and I think we arrived in Australia the day of the Torch Operation, which was the 8th of November 1942, and promptly reported to headquarters in Brisbane. We were received by General Sutherland, the Chief of Staff -- no, I take it back; Sutherland wasn't there. We were received by General Chamberlain, G-3. I was taken to General Chamberlain, largely by the Chief Engineer, Major General Hugh Casey. Since ours was an Engineer outfit, MacArthur looked to him (Casey) as his technical advisor and, of course, under him was Brigadier General (and later Major General) Jack Sverdrup, who was a great fellow and a great engineer. I explained our plan to Chamberlain and members of his staff and they said, "We think you ought to go to New Guinea right away, but you ought to look and see what we have right here."

As I recall it, what they had there was literally nothing. There were two places where what they called amphibious training was going on. One was at Newcastle, where they would use a typical, say, 35- or 40-foot cruiser, and would tow three or four row boats behind it filled with men; this was sad, but typical. At least they were thinking about what they needed to do. The other site for amphibious training was at Turboul Point, where some work of this same sort was going on; utterly worthless.

General MacArthur had just moved his forward headquarters to Port Morseby in New Guinea. General Chamberlain notified General MacArthur that our team had arrived, and he said, "Send Trudeau right up here." I well remember the flight. I don't know whether I put it in my diary or not, but in any event

they sent me out on a C-47, a freighter, carrying some freight. I boarded this plane after a very pleasant dinner in Brisbane with General Casey and some others at about 2:00 in the morning, because they wanted me to arrive in early daylight, which was rather essential because they didn't have much in the way of navigation equipment. I think I mentioned, or maybe I didn't, that on the way down we had to stop and take a look for Eddie Rickenbacker, who was then down in the South Pacific as we went by Fiji.

Q: No, you didn't mention that. You had a note that mentioned your flight and Rickenbacker, but I couldn't understand the relationship.

A: Rickenbacker was down at sea and we learned this as we stopped at our second stop, Canton Island. I think it would be interesting just to diverge for a minute here, and talk about Canton Island in those days. It was heavily fortified. They channeled underground -- it was all coral, of course. It was heavily fortified, and there was about a regiment under the command of a classmate of mine named Bob Elsworth. In any event, this was interesting about our aircraft navigation. We'd stopped in Hawaii -- flights took longer in those days; you weren't moving over 130 or 140 miles an hour. The pilot decided that we would leave at 2100 hours, 9:00 at night, to go to Canton which was two degrees south of the equator. Our plane was really heavily loaded. We sat under extra gas tanks, for instance, and that wasn't the most comfortable. They called it an LB-31 in those days, and it was a converted bomber. It was probably a B-25 or 26; in any event, it wasn't the most comfortable ride. It was slow, but the point that I'd like to make here is that I talked to the navigator, a petty officer loaned by the Navy, and asked him, "What about this 9:00 take-off?" He replied, "Well, we need to get across the equator in the vicinity of Canton Island (two degrees south) at sunrise as it comes up over South America to our left as you'd be looking at it from our plane, because we're flying the sunline." I said, "What does it mean to fly or navigate by the sun line?" He said, "We allow for the maximum drift; we don't have very good meterological data, so we allow for the maximum drift due to wind. I set my course so that I'm sure to be west of Canton Island. I have also scheduled our time of flight so that as the sun appears on the horizon, I can head directly into it and Canton Island should be in our path." "Well," I said, "I hope you find it." And we

did, but this shows you the state of navigation in those days. All this was done with a sextant. Obviously, an error of ten miles per hour in your estimated flight speed, if you ran into head winds, could lose you miles if you didn't gauge it correctly. He got out with an old-type sextant and took a reading of the stars as we flew over the Pacific, but obviously with a difference of 50 or 100 miles in position while you're still heading into the sun, (you) can miss an island like Canton, which is less than three miles long. This is what happened to Rickenbacker farther south. When we got to Canton, there was a message saying that Rickenbacker was down in the South Pacific and that we would follow a certain course and take time to look for him. We didn't find him, but he finally came through. So we arrived in Australia after refueling in Fiji and New Caledonia.

In taking this plane to New Guinea, it was about 3:00 on a Sunday morning. We had had a very pleasant evening and a good dinner. We had a lot of fun, a few drinks, and some singing. When I got on the plane, there were some very large boxes and a half-dozen blankets. There were no other passengers and there were no seats. The crew got in the cockpit and said, "Here are a bunch of blankets, just make yourself comfortable." So I went to sleep. Sunrise was about 5:30 or 6:00, I don't know just when it was, but the pilot came back, shook me, and said, "You'd better get up, Colonel; there are some Zeroes in the area. We're just off the New Guinea coast and you'd better be on the alert." I got up, but I felt terrible. I had a headache, and I knew I hadn't been drinking very much. It's easy to say that, but when I tell you why, you'll realize; I found out then why the smell was odd. I found out that what I was riding with was a cargo of sterno that troops use for shaving and heating their K- or C-rations.

At this altitude this plane was just saturated with sterno fumes. If I'd happened to light a cigarette, none of us would have even got to Moresby, and there was no warning about this hazard. In Moresby, I was billeted with General Casey. I enjoyed a very pleasant three or four days there. General Sutherland and General Aiken, the Signal officer, were there. I explained the program to General MacArthur personally. He was terribly interested, and his staff later quizzed me at great length about communications, operational and maintenance problems. Apparently I

satisfied him and them because he sent word back to the States immediately that he wanted three brigades and wanted the boats to be assembled in Australia. I went back to Brisbane after four of five days and started up and down the coast looking for a place to build an assembly plant.

Q: In your diary you have a note after the conference with General MacArthur: "He was particularly cordial when he learned I was the class of 1924." Do you feel that not only was your project one from which he could benefit, but your reference to West Point helped in bringing him around to buying your proposal?

A: I don't think so. The sea was his only highway to Manila and I feel my story stood on its own merits. He was always most cordial to me and all members of our class. We entered when he entered as Superintendent and he always felt we were "his boys." In later years when I was sent on missions to him on a couple of occasions, he'd never forgotten and always remembered. He always gave me an extra warm welcome. This isn't always the MacArthur you usually read about.

Q: Well, I think this is interesting, because today we find barriers that exist because people don't really know each other. I just throw this in because I think it's a point of human interest that should be mentioned. Next, you were looking for a port facility.

A: Yes, this became very interesting. First I flew south to Sydney, which of course is a great port. I learned, much to my surprise, in looking over the area for facilities to build landing craft, that a company (I've since met the owner but I've forgotten the name) largely in sporting goods -- making tennis rackets and items of this sort -- had in their yard a Higgins-type boat covered up. They must have gotten it off some Navy ship and were getting ready to copy it. My team started exploring up and down that coast. We wanted to locate as far north as practicable. In fact, the most advanced point that I suggested was Milne Bay on the eastern tip of New Guinea. The Japanese had attempted to overrun it. There'd been some Australian troops there, so between the Australians and a bunch of cows they excited, they charged the Japanese as they were landing on the beach and scared them off. We held it. This is on the easternmost tip on New Guinea. You have to round Milne Bay to go to the

north shore, which was wnere MacArthur wanted to go, northwest toward the "slot" toward New Britain along the north shore of New Guinea and on to the Philippines. Buna and Salamaua, all places you associate with his campaigns, are on that north shore. What we planned to do was to outflank the Japanese who were then at Dobadura. When I reported to Port Moresby the Japs were at Dobadura, which was only 35 miles away, over the crest of the Owen Stanley Mountains on the south side. It seemed to me that the sea was the only highway. This is obvious; there was no other way to move from that jungle country to Manila. The sea was the highway. What we were giving them were the only vehicles that could move along it. At that time, he only had a couple of ships called luggers -- which would carry about 100 tons of cargo -- up at Oro Bay on the north shore, which was as far as he could advance. But that was all; he had no transport. He was elated when he found he could get some transport under his Army commander to start moving his troops. He knew that with pressure on to support Europe first, he wasn't going to get too much from the Navy. So he wasn't looking a gift horse in the mouth to get 20,000 Amphibian Engineers. After we looked at Sydney, we visited New Castle and then went up to Rockhampton and there spent a weekend at I Corps, General Eichelberger commanding. It was not yet the Eighth Army. There was only one division, the 41st Division, from the Pacific Northwest, in that vicinity. The 32d Division, the only other one then in Australia, was partly in New Guinea. I visited Turboul Point as a possible site for amphibious training with its very beautiful beaches there. I had a very pleasant weekend and explained our capabilities to General Eichelberger. I have frequently talked about it since with General Byers, who was his chief of staff and knows this whole story, too. They were tremendously interested in our potential. That very night -- it was a Sunday night -- there seemed to be a lot of excitement in the headquarters. They were all billeted in a hotel in Rockhampton on the east coast of Australia. I found out the reason for it the next morning, because General Eichelberger and Byers and the staff took off for Port Moresby in New Guinea. Things were getting pretty bad there. The 32d Division was in very bad shape physically, and it was "touch and go" about turning back the Japs. They sent Eichelberger up there to get things moving or "Don't come back."

I still went up the coast looking for different places to locate. There was a nice little city called Mackay. Then we went on up beyond the Great Barrier Reef to Townsville, which was our northernmost port in use at that time. Then we went farther to the northernmost port on the east coast named Cairns, a small port. It looked as though this might be the place.

Interestingly enough, the Navy at this time was very much concerned about us coming to the Pacific. Admiral Barbey, as I told you before, had been up to Cape Cod and looked us over after we'd been operating for about three weeks, on the 4th of July weekend in 1942. When he reported this back to Admiral King, King was very upset. When we were assigned to Australia, Admiral Kinkaid headed General MacArthur's naval element. When it was announced that the Army was going to send over three amphibian brigades, Admiral Barbey was ordered over. I always felt he had the mission of, "Since the Navy let this happen, go over and get it back under control of the Navy." Barbey came over later, but he was not there during my mission. What was happening was that the Navy was very much concerned about our getting into the picture, and everywhere I went, right along at the same time, looking over the same port would be a certain naval commander. I wish I could remember his name. He contacted me some years ago, and said, "Do you remember this?" He remembered it, and I did too. Everywhere I went the Navy was looking at the same spot, because, they said, "We've got to establish Lion or Acorn bases." This depended on size and content and purpose. This was brought to General MacArthur's attention with recommendations as to where we might locate. The Navy would say, "Well, I think we've got to put a Lion Base there or an Acorn Base." Finally MacArthur said to Admiral Kinkaid, "Make up your mind where you want to go and then the Army can take what's left if that suits them." That sort of backed the Navy off a bit and, to make a long story short, we chose Cairns, Australia. Cairns was a deep enough port for most of our transport in those times -- our Liberty-type ships -- so that didn't concern me. We knew we could put 300 prefabricated landing craft in the holds of one Liberty ship. Now get this, because it's important: the average Navy cargo ship, which had been taking occasional landing craft to Australia if they had nothing else on their decks, could at the best take 12. So when I asked back in Washington initially, "What about getting

landing craft to MacArthur?", they said, "We're getting them down there." And I said, "How many can you get?", and they said, "Twelve on a freighter." I've forgotten how many freighters they could spare to do this, but I said, "Well, that's great. In three years, he can put one division afloat, but this won't win the war." This was one of the punches that helped to get us down there. I said, "We'll go down; we'll deliver 300 a month." This was all done by prefabrication and no wasted space. We baled up side sections, 20 at a time; we could put all the ramps together. When General MacArthur sent back that he wanted the three brigades, the 2d Brigade, which was then at Carabelle, was ordered to Fort Ord, California. The base shop battalion was put into production on the assembly line at Higgins: with its three companies, it operated on a three-shift basis. They learned every manufacturing technique and had the skills to perform. My associates and I in Australia were drawing up plans then with MacArthur's logistic, or Services of Supply (SOS), people to set up operations in Cairns. We drew the design for everything. We started sending specifications back to our Amphibian Command on Cape Cod to buy and assemble what we needed. One of the problems we thought of early was that there'd be times when we wouldn't be operating on commercial electric current; therefore, all of our generators, and all of our power equipment, had to be operable on 50-cycle, 220-volt current. It's a good thing we remembered that, because frequently on the way to Manila we set the Base Shop up in places where there was no commercial current. While we were on the mainland of Australia we had commercial current, so that simplified it.

The 2d Brigade sent an advanced headquarters over. They made the mistake of sending it under a colonel who raised some questions as to his real competence. He damn near killed the operation by indifference and poor management, but I don't think we need to go into that too much. Anyhow, General Heavey flew over shortly thereafter and his 2d Brigade followed by sea. As soon as the 2d Brigade had moved out of Carabelle it opened up that space -- to move the 3d Brigade out of Cape Cod to Carabelle. By this time it was December. Nothing much could be done on Cape Cod; you can't go to sea in small boats on Cape Cod in December or January. The cycle worked out just right from that standpoint.

Then the War Department decided, "All right, we'll establish the 4th Brigade." So the question was where to establish the 4th Brigade. Remember the 1st Brigade went to Europe. There were anti-aircraft troops in Camp Edwards, Massachusetts, then. This was a National Guard camp where we originally established our base, so the Army decided to put the 4th Brigade at Fort Devens, Massachusetts.

Before I get to that story, we probably should wind up the story on getting established in Australia. My little team worked with the Engineers and the other services. We designed the assembly plant and other structures and began improvement of the port facilities at Cairns. Our production schedule called for the complete assembly and launching of ten landing craft daily -- 300 a month. This was our schedule, and when this was approved in December of 1942, I came home. I'd like to jump to the point where I can tell you that on April 11, 1943, which was just over three months from then, the first landing craft was launched at Cairns, Australia, and a production rate of 300 a month was reached shortly thereafter. I'll come back to the launching, because it involves LCVP Number 1, as we designated our first craft launched in Australia. I'll tell you about that one in the Philippines two years later.

The 4th Brigade was ordered activated in January and I was put in command of the brigade by General Noce. The Chief of Engineers, who still had assignment jurisdiction, would not assign me the brigade because, he said, he had some older and more senior officers who were entitled to the command. I organized the brigade and commanded it for six or eight weeks until the officer selected could be released from his River and Harbor assignment and take over. I activated the brigade and commanded it through those first months at Fort Devens. A couple of interesting points here.

Fort Devens had been an anti-aircraft center. We activated the brigade in January 1943. So we had 7,000 new men there for basic training during the very toughest time of the year; quite obviously there could be no amphibious training involved. All of our boats, almost without exception, had been taken by sea from Cape Cod to Carabelle, Florida. This meant that they had to go all the way around the Keys to get there. That was quite a trip in itself. It was done successfully and was a great training exercise to move all of these boats that distance; and it was well

done. By that time, we had fairly large numbers of landing craft with standardized engines of the Detroit Diesel type, so it was possible to maintain something close to fleet speed. In addition, we had gotten the 50-foot tank lighters for carrying tanks, and we had some 105-foot tank lighters, which would take trucks or six tanks. We had some fast patrol boats which were also used for command boats. We were fairly well staffed by that time. The winter training at Devens, of course, constituted good basic training, together with special courses in navigation, marine maintenance, and other subjects. For that purpose, we sent some of our men -- after their basic training -- back to Cape Cod itself, where we still had certain engine maintenance special training. Of course, communications were still a big factor, too -- how to control the ships at sea; we didn't have radar or radios as advanced as they are today. We did use radar, for instance, because we realized that when you got into the over-the-horizon position or in bad weather, you can't see a small craft more than about five to ten miles. One of the tactics we used in order to control and navigate them and still not have the boats talking by radio might interest you. We used balloons. Behind a certain craft, part of a fleet, you would find a balloon on an 800- or 1,000-foot tether, which permitted a control radar to tell them whether to go so many points right or so many points left to hit the right beach which, again, might be over the horizon. This could be done up to a distance of many miles depending on the height of the balloon. So our line-of-sight radar tracking the balloon and knowing the location of the proper beach could direct them how to adjust course. Yet no signal had to emanate from the craft itself to give away its position or draw fire. This was quite novel and it worked.

We had a good brigade: we had excellent training, we worked hard, and I've often thought that my work there was one of the reasons why I had much broader opportunities in the future. General Ralph Huebner was the Director of Training, Army Service Forces, and a top combat officer in his own right. Shortly after the time I'm talking about in early 1943, he was ordered over to North Africa to take command of the 1st Division; that indicated what the Army thought of Huebner as a soldier. In any event, while he was the Director of Training he came up to inspect my new brigade and he went down to the range to observe the firing on what we then called known-distance ranges.

In some cases, our men were firing through channels in the snow (because there was deep snow) and shooting very well. He was so intrigued that he came back a second time and went down to the pits to check on that brigade which qualified on the known-distance range at an 83 percent average. This was a time when whole infantry divisions were averaging sometimes 39 or 45 percent. He was so impressed with it that he went back to Washington and, in one of the meetings there, he chided some important people, I understand, about the quality of training and told them what he had seen in my brigade. In any event, when he was ordered to the 1st Division in Africa he apparently had been so impressed by what he saw that when General Weible, his deputy, was moved up to be Director of Training, I was the one selected to take the Deputy Director job. Shortly thereafter Colonel Henry Hutchings, who was an excellent man in his own right, arrived from River and Harbor work to take command. He hadn't been with troops for years but he was the one the Chief of Engineers decided to promote to brigadier general, so I had to give up my command. At that time General Somervell was over at Casablanca to the conferences (this is early in the spring of 1943). When he came back and found out what the Chief of Engineers had done, he, too, directed that I be pulled into Washington and put into a prospective star slot. He was really teed off that I didn't keep the brigade, after my success in Australia. I moved to Washington in April of 1943, left my family on Cape Cod until the children finished school in June, and then moved them to Washington.

I could see that in Washington I was still going to have many things to do for the Amphibians; remember, only the 2d Brigade had then departed. The 3d was moving to Ord. The 4th was to follow, but the 4th was still just in basic training and ready to move to the shore. They went straight to Carabelle in early spring when the 3d went west to Fort Ord. I can't be sure of those dates because, as I say, I was then detached. But the minute I got to Washington, General Somervell assigned me as the Amphibious Advisor on his staff, so I wasn't getting away from this at all. I was assigned to the Joint Strategic Amphibious Subcommitte of the Joint Chiefs of Staff in addition to my other duties; but one of the toughest jobs was this. In the first place, the Navy was less than enthralled with the idea that the Army was going to the Pacific in some numbers to do an amphibious job. We envisioned clearly the scalloping operations up the

coast of New Guinea and beyond, the sea being the highway; that's all it amounted to. We sensed fully that our real problem was going to be supply. If there's one thing the Army knew how to do, it was to supply people, and that was the purpose of Somervell and the ASF, the Army Service Forces. We never had adequate support from the Navy regarding supplies, because our problems were different. The people down at the level where they were actually doing this work in the first place hadn't much experience in amphibious work themselves. Secondly, they had no appreciation that while a Navy amphibious craft is carried on the deck of a transport, and is only lowered into the sea perhaps once in three months, our little craft, the same type, were in the water every day, all the time, never left it; so the problems of supply and maintenance were entirely different from what Navy experience told them it would be. Furthermore, in connection with propellers or "wheels" as they're called in the yachtsman's language, it's practically a subject for court martial to damage the propeller on a ship. That means you haven't navigated it right, or you've gone aground. Well, in our job of landing craft we wanted to go aground, and when we hit a shore we rammed the hell out of it so that the boats wouldn't broach; in other words, turn sideways and get stuck in the sand or overturn. The factor we used for propellers or wheels was something like 20 or 30 times the Navy's. One of the problems we had on Cape Cod . . . we had about 50 ships at first, so the Navy allowed us something like 20 propellers for six months' replacement. Fortunately, we had enough rapport with the War Production Board, at it's Boston office, to get priority on brass propellers, so we went out and bought 1,000 Columbia wheels, as they called them. When the Navy heard this they just about fell apart; they never heard of anybody ordering 1,000. Well, we ordered 1,000 and they were all used -- and a lot more before we got through the Southwest Pacific. The point I'm making is that, despite the fact that these were standard Navy craft, once they were assembled in Cairns and put to sea we could not depend on adequate logistics support from the Navy. Frequently they weren't around or they didn't have a local base there. So I established with ASF authority a direct pipeline to Australia, and we shipped them the parts that ensured good maintenance and good operating capability on the part of our landing craft. Otherwise, they never would have functioned; they couldn't have functioned. So that became, in addition to my Director of Training job, a continuing

function; to advise General Somervell on the adequacy of landing craft, the time of production -- and, mind you, this was not only with reference to the Pacific. This was the planning for the cross-channel operation coming up in 1944 that we were dealing with primarily in Washington.

Q: General, (didn't) most of your correspondence during the time that you were the Director of Training tie in with the Amphibian Command?

A: It had to. If they had been cut loose from support direct from Washington, they couldn't have functioned. That's all there is to it. You see, while most of the landing craft themselves were coming from Higgins, nevertheless there were engines, communication equipment, and all sorts of items that had to be obtained from many vendors. We took over a large warehouse at the Stockton Depot, and there we would assemble 300 units of every item from boats to insignias. When we knew we were going to have 300 complete units ready we'd call for priority on a ship. This would take a whole ship, and 300 boats and supplies would be on their way to Australia. That's how and why it worked. In addition, it soon became apparent that we needed larger craft so we stepped up to tank lighters. You remember, even the Navy chose the Higgins-type over their own design.

This is an interesting story on tank lighters. The Army changed from a 30-ton tank to a 34-ton about that time, but they hadn't told the Navy about this; the result was that the LCM3, as it was called, wouldn't carry a 34-ton tank; it was really considered an overload. What happened on this was that at Higgins, where they were manufacturing tank lighters for us, they would build a complete tank lighter, except for putting the ramp on. We would then take that tank lighter and with blow torches cut it into twelve pieces -- believe it or not -- so that we could store it down in the hold of a ship. When we sent that to Australia, it was a sight. A tank lighter, for instance, had two Diesel engines in its rear; the smaller landing craft have only one. You'd be amazed to see the stern of a craft staring at you with two of these engines sticking out and the rest of it cut up into eleven other pieces plus a ramp. But this is the way it was shipped. When they arrived overseas, men with welding torches and rivets and gussets and fish plates put all the pieces back together again, and we had something stronger than ever. While developing

this technique we ran into the 34-ton tank problem. So here's what we did. The men were cutting these tank lighters in twelve parts anyway, and one of them said, "Well, why don't we add a six-foot section in the middle when we're welding it together again. Just add another six-foot section of the same cross section and stretch it to 56 feet." The result was most interesting. It not only would take the 34-ton tank by providing additional buoyancy, but it gave us two inches less draft and two knots more speed per hour for the same fuel consumption by increasing the length. We had less displacement. That's the net payoff that we got on that one, which was amazing. That became the Navy standard craft, known as the LCM6, which means 56-foot. That's just how it was developed.

Q: The question that I have pertains to General MacArthur's staff, General MacArthur's tactics. You indicated that when you went to his headquarters, you were able to provide him with means that he didn't have. The question that I have is, weren't they asking for something like this? Didn't they recognize that their roadways were the water? How did he anticipate that he was going to do his island hopping?

A: Only by sea, getting ships of some type which the Navy didn't have. It never occurred to them that the Army was also in the amphibious business.

Q: But he really hadn't made a case back in Washington?

A: Not one that had been listened to too much. I don't know what representations he had made, actually, but Washington was concentrating on Europe.

Q: It's an interesting thing that you arrived with just the things that he needed.

A: That's right, and at just about the right time. You see, while these were small landing craft, there was nothing else available at the time. The Navy was coming up with a 105-footer and then the LST, which was about 300 feet long. We took a 105-foot tank lighter to him. This also is a very interesting story.

We used to get a Navy LST as the larger craft came in; the landing ship tank (LST) is around 390 feet long. It has giant jaws that open up and in it you can put a large number and tonnage of vehicles and equipment.

The question we faced first was how to get the 105-foot tank lighter over to Australia. Now, the 105-foot tank lighter would take six tanks or trucks or about 200 tons of cargo. It was 105 feet long. It was also interesting because one of the smart things they did was to power this ship with three General Motors Diesel engines; the same engines with the same parts that the LCM tank lighter has two of and the 36-foot landing craft had one. This was wonderful for standardization. In any event, the question came up, how do we get 105-foot lighters over there, which is 9,000 or 10,000 miles and a rough voyage at eight or nine knots speed. What happened was this. A way was found to lift these tank lighters; put them on the deck of an LST and lash them down. Then when they got over to the theater, they would shift the ballast on one side of that tank lighter so that it got about a 15-degree list, cut the ropes holding it on the LST, and slide it into the sea. It made quite a splash, but it worked; that's the way the 105-footers got down to Australia.

Q: Let me ask a very direct question, personal. I noticed that some of the older people were getting promoted around this time, and you didn't. I don't know the reason, but I'm wondering if perhaps your enthusiasm, and your interests in this activity might have had anything to do with delaying your promotion.

Perhaps the problems with the Navy . . . . I know you're a fighter.

A: I don't believe so. Actually, I am aware that my name was on a list, which was personally passed on by General Marshall once a month, for something over a year before I got the promotion. Priority was given to those who most needed the reward; the combat commanders in the front line.

Q: General, do you feel that there's more to the Engineer Amphibian Command story? I know you wrote volumes about it and we have much information. I'm wondering if there might be any other clashes to be brought out that might be of interest or provide good lessons.

A: The competition with the Navy and the failure to have good support from our Army Ground Forces in recognizing this as an essential part of Army operations to my mind was part of it. The Marines had been doing what little was done before World War II, but it wasn't really much despite their claims. I

think our concept of shore-to-shore operations where it applies and under Army command made a lot of sense. This could be particularly true today, where we have higher-speed landing craft and helicopters, if you're in an area where they can be utilized, such as a water gap of 50-100 miles. There are a lot of questions about the future of amphibious warfare, particularly when you've got the ability to land troops by air, and there are many limitations, but I haven't had any reason to study it from a strategy standpoint for many years now.